

“There would be obvious advantages to bringing a unified political control over the management of a single ecosystem [or bioregion]... In the latter part of the twentieth century it appears more feasible to seek close cooperation among the agencies involved in management of a bioregion than to attempt the redrawing of political maps.”



R. F. Dasmann



KEY RESULT AREA 4

Institutional Coordination and Cooperation

Desired Result: *Strong, institutionalized partnerships for the management of water resources among all levels of government, the private sector, non-governmental organizations, and individuals with an interest in sustainable water resources management.*

What does institutional coordination and cooperation mean? Integrated management requires that all the related aspects of the water resource be considered in decision-making at all levels and within many jurisdictions. Successful implementation of this Plan requires a high degree of coordination and cooperation, including horizontal and vertical integration, and partnerships institutionalizing these relationships.

Why is institutional coordination and cooperation important? Historically, water resources management has been fragmented, with different agencies and multiple players working on their own programs and agendas — often redundantly, sometimes at cross-purposes, and usually on single issues. We now understand the need for integrated management, coordination, and collaboration. The Basin Plan is the product of a collaborative planning effort by a wide range of Basin stakeholders. While it is clear that an integrated approach to managing our water resources is important, achieving and sustaining the necessary level of coordination and cooperation among the Basin’s many decision-makers and other stakeholders requires that relationships among partners be reflected institutionally — how we make decisions and “do business” on a daily basis.

Horizontal integration means coordinating actions and programs among actors operating within a level of jurisdiction.

- **External:** Where two or more agencies at the same jurisdictional level have responsibility for an aspect of water resources, there is a need for consistency in the application of policy. For example, the agencies responsible for floodplain and stormwater management need to work together to achieve a uniform policy message and outcome.
- **Internal:** Departments within agencies must establish consistency among programs. For example, offices responsible for wastewater management plan approval, water allocations and facility permitting need to coordinate plan and permit review requirements. This will result in a more comprehensive overview of water resource use and can lead to streamlined review processes and greater overall efficiency.

Vertical integration involves the alignment of efforts at various decision-making levels to achieve consistent outcomes. For example, when the Federal government sets minimum standards pursuant to the Safe Drinking Water Act, the states must adhere to them (unless they adopt more stringent ones), and regional and local



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“The DRBC’s framework for regional coordination under the federal-interstate compact mechanism appears unrivaled by any existing or proposed institutional arrangement.”

Western Governors’
Association Report, 1982

jurisdictions must apply these standards when exercising their permitting or management authority.

Stormwater and flood management represent another far more complex example. Stormwater involves issues of quality, quantity and timing for which policies, plans, regulations and permits must be developed and approved. Flood management shares a concern with timing and quantity, but involves event forecasting and response activities, mitigation planning, and inspection activities to minimize loss of life and property. The variety of concerns associated with stormwater and flood management are mirrored in our institutionalized approaches. An array of federal, state and local agencies are responsible for the various aspects of stormwater and flood management. The challenge lies in coordinating them to secure uniform policy and consistent outcomes.

The Value of Partnerships: Partnerships play a critical role in fostering integration management efforts. Partnerships offer:

- *A Common Focus:* Attention on a common concern or landscape draws together different interests.
- *A Level Playing Field:* In a partnership all participants regardless of their authority, financial or political interests, have an equal role in decision-making.
- *Improved Communication:* Sectors that are often isolated from decision-making can have a voice in the decision process.
- *Information Exchange:* Partnerships provide a forum for instantaneous information exchange and increase understanding of the environmental, economic and political consequences associated with the issue.

Merrill Creek Reservoir



MERRILL CREEK OWNERS GROUP

Institutional Coordination and Cooperation

Coordination and Cooperation are necessary to:

- Ensure consistency among state laws and state and local regulations, ordinances and plans
- Support the integrated management of land and water resources
- Enable multi-municipal approaches to address growth management and water resource issues in a watershed context
- Support and implement watershed-based trading
- Coordinate flood hazard mitigation planning and implementation
- Coordinate recreational planning and facility development
- Coordinate restoration activities
- Control the spread of invasive species
- Design and implement nonpoint source runoff controls
- Support effective habitat conservation and protection projects
- Support coordinated research, study, and monitoring of streams to further our understanding of ecological processes
- Develop and adopt integrated resource management plans
- Accommodate the rights of New York City and New Jersey under the 1954 Supreme Court's decree, improve water flows necessary to sustain growth in the down-Basin states and to protect fisheries and ecosystems

Goals for Institutional Coordination and Cooperation

- 4.1 Improve coordination and cooperation in the management of water resources in the Basin.
- 4.2 Increase sharing of data, information, and ideas among Basin institutions, agencies and organizations, and reduce duplication.
- 4.3 Secure adequate resources for programs and projects that encourage cooperative water resources planning and management.
- 4.4 Use water resource partnerships to support and execute water resource management in accordance with the Guiding Principles, Goals and Objectives of the Basin Plan.
- 4.5 Utilize the planning and regulatory powers of a regional governmental authority, the Delaware River Basin Commission, to facilitate coordination and cooperation.

GOAL 4.1: Improve coordination and cooperation in the management of water resources in the Basin. This Goal cuts across all of the Key Result Areas encompassed in this Plan. There is not one single “cookie-cutter” approach to improving coordination and cooperation among the many agencies, businesses, elected officials, non-profit organizations and individuals who play a part in managing the Basin’s water resources. For each area of research, planning, policy, management or decision-making that this Plan addresses, several steps must be taken to improve coordination and cooperation. The details of how to deal with each of the issues described below varies with the particulars of each area.

Defining the key players whose efforts must be coordinated. The list may include both Federal and state agencies, local units of government, business and industry, research institutions, and citizen groups. When identifying key players, it is important not to neglect stakeholders whose perspectives may not be reflected



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“Any river is really the summation of the whole valley. To think of it as nothing but water is to ignore the greater part.”

Hal Borland  
*This Hill, This Valley*

by the existing decision-making structure. Coordination must take place both as collaboration across different areas of interest (horizontally) and as alignment within a single institution or hierarchy of institutions (vertically).

## **Identifying the relevant policies, laws, regulations and planning or permitting processes which need to be better aligned, made more consistent, or otherwise coordinated.**

Conflicts among plans, laws, or regulatory regimes may reflect real differences in objectives, as well as lack of communication. This Plan and its Guiding Principles are intended to help overcome these differences.

**Creating a vehicle for collaboration that can bring the key players together.** Depending upon the players involved and the plans, regulations, or activities to be coordinated, this may take the form of a collaborative planning process with a defined objective and deadline e.g., a technical working group that convenes periodically or an advisory committee that reports to a lead agency. Not all players may be on an equal footing with respect to resources and responsibility. Consequently, when establishing partnerships or collaborative efforts, it is important to take into account the constraints and costs of individual contribution to ensure effective participation by all parties.

## **GOAL 4.2: Increase sharing of data, information, and ideas among Basin institutions, agencies and organizations, and reduce duplication of effort.**

**Making information available in accessible formats.** Federal, state and regional agencies and non-profit environmental organizations collect a broad array of water resource-related data. This information must be available in formats that can be easily interpreted in order to implement this Plan. Maps, for example, are easy to read and can be particularly useful for policy and planning purposes when associated with GIS spatial coverages that allow the overlay of other data.

**Assessing the usefulness of collected data.** While basic information is usually straightforward to use, other raw data — such as daily precipitation, stream flow, or monthly water quality reporting — are not directly usable by policy and decision makers. This kind of data needs to be compiled and analyzed prior to use. In addition, some data needs to be interpreted to be of significant benefit to users.

- ☛ **The question of watershed scale is critical to our understanding of water resource issues and to the measures we develop and employ to address them. Specific problems must be understood within their local context. A regional or Basin-wide context should also be considered when evaluating alternatives.**

**Identifying gaps and overlaps in data collection.** Partnerships may be able to help fill gaps in data collection or eliminate duplication where efforts overlap.

**Providing a forum for discussion and analysis of available information.** There is a vast array of information, data, conjecture and misinformation available from many sources. Making sense of this information requires the opportunity to share, discuss, debate, learn and solve problems. Issue-based forums provide networking opportunities, forge partnerships, and enhance the stewardship of water resources.

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**GOAL 4.3: Secure adequate resources for programs and projects that encourage cooperative water resources planning and management.** Always a necessity and a challenge, targeted, strategic provision of resources is necessary to address the Goals of the Basin Plan.

**Identifying existing resources.** Many state, regional, and local programs are actively engaged in promoting, protecting, and enhancing water resources. An initial assessment of current or planned activities and programs can be compared with the Plan Objectives to determine which issues require special attention and cultivation of resources.

- Explore additional resource opportunities to support investigation, monitoring, planning, assessment and implementation activities.

**Identifying and increasing opportunities to leverage federal and state funds for water resource planning, protection, and restoration.** Create opportunities that encourage multi-jurisdictional approaches for programs and projects that encourage cooperative water resources planning and management.

**GOAL 4.4: Use water resource partnerships to support and execute water resource management in accordance with the Guiding Principles, Goals and Objectives of the Basin Plan.** This Plan was developed with input from individuals representing federal, state, and local government agencies, businesses and non-governmental, non-profit organizations. Implementation of this Plan will require the continued efforts of these partners and others.

**Engaging a cross-section of Basin stakeholders to implement the Basin Plan.** While the DRBC will have primary responsibility for compiling data relevant to measuring milestones and indicators, Basin partners need to continue to provide input and oversight.

The 13,539 square miles of Basin territory is too large and its conditions too varied to engage local participants effectively on a Basin-wide scale. However, effective engagement of local contributors from the 838 municipalities, 42 counties, and myriad watershed associations is essential. Watershed regions, defined by grouping adjacent watersheds, perhaps those of the HUC 11 scale (see “Key Result Area 1: Sustainable Use and Supply,” and the “Water Regions of the Delaware River Basin” map) offer a means of addressing local and regional issues and effectively engaging participation. Several regions have already successfully organized such as the collaborative efforts established for the Lehigh and the Schuylkill Rivers.

**GOAL 4.5: Utilize the planning and regulatory powers of a regional governmental authority, the Delaware River Basin Commission, to facilitate coordination and cooperation.**

**Coordinating federal and state agencies within the Basin.** The Delaware River Basin Commission is a federal-interstate agency, established by compact to manage water resources within the Basin. One purpose of the Commission is to coordinate the management of a common regional resource that was previously subject to administration by 43 state agencies, 14 interstate agencies and 19 federal agencies.





# Institutional Coordination and Cooperation

## EXAMPLES OF COOPERATIVE WATERSHED PLANNING

Schuylkill Watershed  
Conservation Plan, PA 2001  
([www.schuylkillplan.org](http://www.schuylkillplan.org))

Final River Management  
Plan for the Upper Delaware  
Scenic and Recreational River,  
National Park Service —  
NY-PA 1986  
([www.nps.gov/upde](http://www.nps.gov/upde))

Watersheds: Integrated Water  
Resources Plan for Chester  
County, PA 2002  
([www.chesco.org/water/index.htm](http://www.chesco.org/water/index.htm))

White Clay Creek and its  
Tributaries — Watershed  
Management Plan, National  
Park Service-DE-PA 1996  
([http://mercury.ccil.org/~wcc\\_ws](http://mercury.ccil.org/~wcc_ws))

Clean and Plentiful Water:  
A Management Plan for the  
Rancocas Creek Watershed,  
NJ 2003  
([www.co.burlington.nj.us/rancocas](http://www.co.burlington.nj.us/rancocas))

Rain-Swollen Delaware River, October 30, 2003



C.D. RUPERT

**Managing water resources pursuant to a comprehensive plan.** The compact authorizes the Commission to develop and adopt, after public hearing and with input from the states and their political subdivisions, a comprehensive plan for the immediate and long-range development and use of the water resources of the Basin. The Commission should use its Comprehensive Plan to coordinate the goals and activities of government agencies, and to guide and where appropriate, regulate private activities.

**Using the Commission's multi-faceted authority to assist and administer water resources in an integrated manner.** The Commission is uniquely placed to integrate and provide consistency among federal, state and regional water resource programs. The Commission's Compact grants broad powers in areas of water supply, pollution control, flood protection, watershed management (including soil conservation and fish and wildlife habitats), recreation, hydroelectric power and surface and ground water withdrawals and diversions.

**Leading by example and guidance as well as through regulation.** The Commission should use its planning authority and leadership to educate, partner with other public and private entities, and demonstrate how water resources can be wisely managed. Where coordinated efforts are important, the Commission should explore utilizing regulatory mechanisms such as setting performance standards that allow states, political subdivisions and private parties maximum flexibility to select the methods to meet the standards.

### Emerging Challenges

An ongoing challenge for resource managers and decision-makers is responding to changing conditions and uncertainty. This includes keeping abreast of new information on current problems as well as being aware of emerging issues. The Guiding Principles that preface this Plan serve as a foundation for the development, analysis and application of alternative solutions to water resources issues. They direct us to consider the links among the physical, biological, chemical and hydrologic systems as well as the economic, political and social consequences of potential actions as a part of integrated management efforts.

Information sharing, coordinated analysis and collaborative actions are all integral to success in dealing with emerging issues. Many of these issues are especially daunting due to the potential magnitude and range of their impacts and the uncertainty of our predictions.

**Climate Change:** In 1998, the U.S. Global Change Research Program and federal agencies sponsored regional assessments to determine the potential consequences of climate variability and change for 16 regions. “Preparing for a Changing Climate: The Mid-Atlantic Overview”, published in March 2000, presents the initial results for the region that includes the Delaware River Basin. The assessment is based on the convergence of climate model projections that the region will become somewhat warmer and perhaps wetter, with potentially more variability in climate. Overall, the report indicates greater heat-related impacts to human health and substantially greater negative impacts on coastal zones, biodiversity and ecological functioning.

The assessment suggests that climate change poses diverse and potentially large risks to the region’s ecosystems. This is due to lingering effects from earlier degradation that are compounded by continuing pressures on many of the region’s ecological resources at a time of growing societal demand for ecological resource protection, both for its own sake and for recreational uses. Although there may be a slight increase in available water, *water quantity* may be slightly more variable due to droughts and floods.

The three most important actions identified by the assessment are:

1. Use a watershed perspective to reduce flood damages and protect water quality
2. Remove incentives for practices that place people, investments and ecosystems at greater risk, e.g., promoting building in areas vulnerable to erosion and flooding
3. Set up communication, learning tools and programs that help the regional community’s identify how they can capitalize on benefits and reduce damages from climate change
  - **Monitoring and analyzing conditions, discussing and agreeing on strategies to minimize impacts, and making decisions to confront the damages that might occur from sea level rise and climatic change requires the involvement of all agencies and partners. It challenges our flexibility and resolve.**

**Invasive Species Management:** As mentioned in “Key Result Area 2: Waterway Corridor Management,” competition from invasive species is second only to habitat loss in its impact on ecosystem integrity. An invasive insect, plant, or animal may have a very solitary and silent introduction into its new environment. As it





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**"Anything else you're interested in is not going to happen if you can't breathe the air and drink the water. Don't sit this one out. Do something."**

Carl Sagan

reproduces, it may successfully compete for food and habitat and displace native species, or simply create a new niche for itself. There may not be any predators to keep its populations in check. Most frequently, individuals remain unnoticed. It isn't until we observe the destruction of its food source or its competition that we are alerted to the invader.

The challenge of invasive species involves identification, knowledge of foraging and reproductive cycles to determine the safest method of control or eradication. It is also necessary to understand the route of introduction in order to impede or prevent the importation of additional members. Invasive species threaten the health and diversity of our ecosystems and many of our commercial enterprises. Multiple agencies need to share information and work cooperatively to develop elegant responses to control or eradicate harmful invasive species.

**Emerging Water Quality Challenges:** We continue to improve our ability to detect ever smaller amounts of substances in our water. The EPA currently establishes water quality standards for many of them, including man-made chemicals, naturally occurring contaminants and pathogens. In addition, new chemicals are continually developed for use in agricultural production, as additions to animal feed for improving growth, and as supplements and medications for promoting human health. Via stormwater or wastewater, many of these compounds enter the environment and the water supply. Our understanding of the long-term effects of many of these substances is poor compared to their widespread use.

Advances have been made to understand the effects of some substances, such as DDT and PCBs, banning their use and managing known sources on the landscape. However, there is a growing list of potential contaminants, and a increased concern for the potential ecological and human health effects. For many substances in our water, there is incomplete information on long-term effects. The impact of complex

White Clay Creek



DAVID L. MILLS

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mixtures of chemicals is poorly understood. The ability of some substances to mimic hormones and affect reproductive ability and outcomes also needs further study.

Improved institutional coordination and cooperation to develop new management strategies and alternatives will be relied upon to deal with the challenge of climate change, water quality and other emerging issues. Ultimately, the decisions made by institutions are based upon our collective knowledge and appreciation of the complexities of our water resource systems and how our actions can both positively and negatively affect them.

The following section, “Key Result Area 5: Education and Involvement for Stewardship,” focuses on the need to foster a sense of stewardship through education, outreach, and opportunities for action. Improving our understanding of our relationship to water, and embracing our role as stewards of this critical resource is essential for ensuring the sustained productivity of both the ecological cycles of nature and the economic and cultural viability of our society.

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## Institutional Coordination and Cooperation

### Prior to 1930

First Philadelphia Intake on the Delaware (1850)

### 1930 to 1934

Corps of Engineers 308 Plan, First Comprehensive Water Resources Plan for the Delaware Includes Proposal for Tocks Island Dam

### May 1931

U.S. Supreme Court Decree Supports NYC Diversion Rights

### May 25, 1931

U.S. Supreme Court grants New York City the right to withdraw 400 million gallons a day (mgd) from two reservoirs to be built on headwater tributaries feeding the Delaware main stem.

### 1936

Three Basin states, New Jersey, New York, and Pennsylvania, create the Interstate Commission on the Delaware River Basin (INCODEL), an advisory body which establishes water quality standards and begins taking measures to meet them. The State of Delaware joins in 1938.

## 40's

**December 1941 to August 1945**  
WW II

### June 7, 1954

An amended 1931 U.S. Supreme Court decree permits New York City to increase its withdrawal rate to 800 mgd, contingent on the city's construction of a third in-basin water supply reservoir, and on the city's consent to release from its three upper-basin reservoirs sufficient water to assure adequate stream flows down river. The decree also permits an out-of-basin diversion to central and northeastern New Jersey through the Delaware and Raritan Canal.

### July 1955

Governors Meet to Discuss Regional Watershed Management

### August 1955

Record Flooding in Basin

### Summer 1955

NYC's Pepacton and Neversink Reservoirs Become Operational

### 1956 to 1960

Corps of Engineers Comprehensive Study of Delaware River Basin

### July 1955 to December 1960

The Basin state Governors look at ways to put regulatory muscle behind INCODEL, creating a regional body with the force of law to oversee development and control of the river system. The worst flood in the Basin's recorded history — a flood that takes 99 lives — leads Congress to direct the U.S. Army Corps of Engineers to develop a comprehensive physical plan for the Basin. The Corps' December 1960 report calls for 58 water control projects to be built over a 50 year period. The largest dam in the plan is for the main stem of the river at Tocks Island.

### September 1961

President Kennedy signs the Delaware River Basin Compact, creating the Delaware River Basin Commission (DRBC), and marking the first time in the nation's history that the federal government and a group of states had joined together as equal operating partners in a river basin planning, development, and regulatory agency.

### 1962

Authorization of First Mainstem Dam at Tocks Island

### 1961 to 1967

Record Setting Drought Grips Basin

### 1965

Cannonsville Reservoir Becomes Operational

### 1969 to 1974

National support for environmental protection leads to legislation requiring environmental impact statements, the establishment of the US EPA, and federal programs for expanded water quality protection. The Basin states establish departments of environmental protection and conservation.

## 60's



# 70's

**1970**

Adopted National Environmental Policy Act (NEPA)

**1971, 1972**

Tocks Island Dam Construction Delayed; Environmental Issues Unresolved

**1972**

Federal Water Pollution Control Act Amended (Clean Water Act (CWA))

**1974**

Federal Safe Drinking Water Act (SDWA)

**1975**

Commission Votes Against Construction of Tocks Island Dam

**1976**

DRBC Begins Level B Study to Identify and Resolve Water Resources Issues

**1978**

Upper and Middle Delaware Scenic and Recreational River Established

**1979**

Good Faith Negotiations Begin

**1978 to 1983**

A record drought during the 1960s, followed by opposition to plans to dam the Delaware at Tocks Island, led the DRBC to examine alternative ways to provide adequate water supply during droughts. Five years of deliberations among the 1954 Supreme Court decree parties result in a "Good Faith Agreement" which includes 14 recommendations focusing on drought management. The foundation for the Agreement, the Level B Study released in 1981, identified a preferred plan of action for water resources management through 2000.

**1980**

Southeastern Pennsylvania Ground Water Protected Area Established

**May 1981**

Level B Study Released

**1983**

Good Faith Agreement Adopted

**1988**

Delaware Estuary Awarded Status in the National Estuary Program

**June 1989**

Dedication of Merrill Creek reservoir that replaces consumptive losses from power generation, part of the Good Faith Agreement.

# 80's

**1986 to 1992**

Water conservation program established by DRBC for Pennsylvania's portion of the Basin.

**1996**

Comprehensive Conservation Management Plan (CCMP) Adopted for the Delaware Estuary

**1998**

Withdrawal limits set for Southeastern Pennsylvania Ground Water Protected Area established in 1980.

**April 1999 to September 1999**

DRBC leads Basin-wide effort to determine public opinion on water resource related issues. Results were advanced in the "Flowing Toward the Future" report released in September 1999.

**September 29, 1999**

Governors of the four Basin states sign the "Resolution on the Protection of the Delaware River Basin" and call for the development of a new comprehensive water resources plan for the Basin.

**October 2000**

Lower Delaware River and White Clay Creek joined the Upper and Middle Delaware River and the Maurice River as part of the national Wild and Scenic River system.

**December 2003**

TMDLs Established for PCBs in Tidal Portions of the Delaware River

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## Water Resource Management Highlights

**Figure 10: Basin Events Timeline**  
(Sources: *Damming the Delaware: The Rise and Fall of Tocks Island Dam* by Richard C. Albert, and DRBC documents.)